Benefits of the NASA/Florida Minority Institution Entrepreneurial Partnership Program

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Abstract

The NASA-KSC/Florida Minority Institution Entrepreneurial Partnership (FMIEP) was established in June of 1997. The partnership is an alliance between NASA-Kennedy Space Center (KSC) and four Florida Minority Institutions: Bethune-Cookman College (B-CC) from Daytona Beach, which is the lead consortium member, Edward Waters College (EWC) from Jacksonville, Florida Memorial College (FMC) and Florida International University (FIU) from Miami.This partnership is a two-year program that allows faculty, graduate, and undergraduate students to work with different groups and organizations from NASA-KSC. Students are exposed to market research, technical problem solving, electronic commerce, marketing, web page design, Small Business Innovative Research program solicitations, and to NASA developed technologies available for commercialization. This paper presents a compendium of the first year results of the NASA-KSC/FMIEP. The achievements of the participating institutions include collaboration with the Technology Outreach Program (TOP), which enables businesses to obtain free technological assistance. In addition, FMIEP has targeted and assisted a number of Florida businesses currently preparing to submit Small Business Innovative Research (SBIR) proposals to NASA. Besides assisting individual tenants of the Florida/NASA Business Incubation Center (FNBIC), FMIEP students and faculty worked with the center's administration on improved marketing and recruitment of FNBIC tenant companies. Furthermore, a faculty and graduate and undergraduate students at Florida International University (FIU) have evaluated several technologies developed by NASA-KSC for commercialization by industries manufacturing related technologies. FIU is also developing the Searchable Answer Generating Environment (SAGE) application prototype. The purpose of this KM System is to create a repository of experts in the State of Florida (FL) State University System (SUS). The main benefit of the NASA-KSC/FMIEP is that it has brought together university-based technical and entrepreneurial expertise, solutions to real life business technological problems, and transfer of NASA-KSC technologies to the market sector.

Introduction

Entrepreneurship plays a key role in ensuring the successful growth of companies, especially when creating value-added jobs that focus on high technology goods and services. By drawing technical and business talent from a comprehensive pool of individuals, opportunities are being created that will help the United States remain competitive in the high tech arena, and ensure that all it's resources (especially those being developed by NASA-KSC center) are being maximized. In recent years minority groups have been poorly represented among the legions of high-tech entrepreneurship because very few colleges include this course in their curriculum (Office of Advocacy, 1994). The incorporation of entrepreneurship into the academic practices of faculty and students at Historical Black Colleges, Universities, and Minority Institutions (HBCU/OMI) effectively counteracts the lack of minority participants in the establishment of small, high-tech companies. The Florida Minority Institution Entrepreneurial Partnership (FMIEP) has provided first hand knowledge of the practices and challenges of small businesses. This program better prepares the participants of these institutions to disseminate information about, and embark on high-tech, small business ventures (Becerra-Fernandez et. al.,1999).

The FMIEP consortium has accomplished its objectives and has further produced outstanding results. It has productively drawn in the remarkable resources of four Minority Institutions in the state of Florida. With NASA's assistance, the faculty and students of the participating institutions have been encouraged to collaborate with the technology transfer programs to promote entrepreneurship. These institutions have gained practical experience from programs that are already proven and in place. During the first year, the program has allowed faculty, graduate, and undergraduate students to participate in the NASA-KSC State of Florida Technology Outreach Program, the Florida/NASA Business Incubation, the Technology Development Program, projects within the

NASA-KSC Technology Programs, The Technology Programs and Commercialization Office (TPCO), and the Southern Technology Applications Center (Becerra-Fernandez et. al., 1999).

FMIEP Program

The NASA/FMIEP consortium is a partnership between NASA/KSC, four minority institutions in the state of Florida, and the Technological Research and Development Authority (TRDA). The schools participating in the program are: Bethune-Cookman College (B-CC), which is the lead school located in Daytona Beach; Edward Waters College (EWC) in Jacksonville; and Florida Memorial College (FMC) and Florida International University (FIU) in Miami. The minority institutions are widely dispersed throughout the state, allowing people and businesses in North, Central, and South Florida to benefit from this partnership with NASA. Figure 1 shows the location of the minority institutions throughout the state.

There are many potential benefits to minority institutions from the NASA/FMIEP consortium. The program draws on the strengths of each of the scholastic institutions and invites faculty and students to collaborate with the technology transfer that promotes entrepreneurship through NASA assistance. The students learn the basics of establishing and operating small businesses. They work with NASA-KSC and thereby create stronger relationships between NASA and the Florida-based Minority Institutions. There are 76 minority students including African-Americans and Hispanics that participate in the program. Out of the 76 students participating in the program, 42 are female (55%) and 34 are male (45%).

The NASA/FMIEP program results in an enhanced relationship between NASA-KSC and the minority institutions, broadening the potential for future joint programs and contributing talent and resources to existing outreach programs. Students and faculty with academic specialties in the areas of business, marketing and engineering greatly enrich the capabilities of the Commercialization Office at KSC. This program maximizes the benefits of proven programs by recruiting faculty and students to entrepreneurial ventures of NASA technologies. This program also expands the knowledge and helps to foster the technologies that have been developed for the space exploration missions and that could have great benefits on Earth. The program assists NASA to seek out commercialization partners for its new technologies and promotes community awareness of the various NASA-KSC activities.

There are a number of benefits and applications received by the Florida industry from NASA-KSC technologies. These benefits include creating or saving jobs by establishing a NASA Florida network that provides free technical assistance to Florida companies. This assistance helps create a new economic activity that can accelerate the transfer of NASA technology to Florida Industry. These Florida businesses are assisted through Small Business Innovation grants, marketing plans, business plans and accounting systems. Furthermore, these businesses are establishing a potential commercialization partnership with NASA technologies thereby creating a community awareness of NASA-KSC activities.

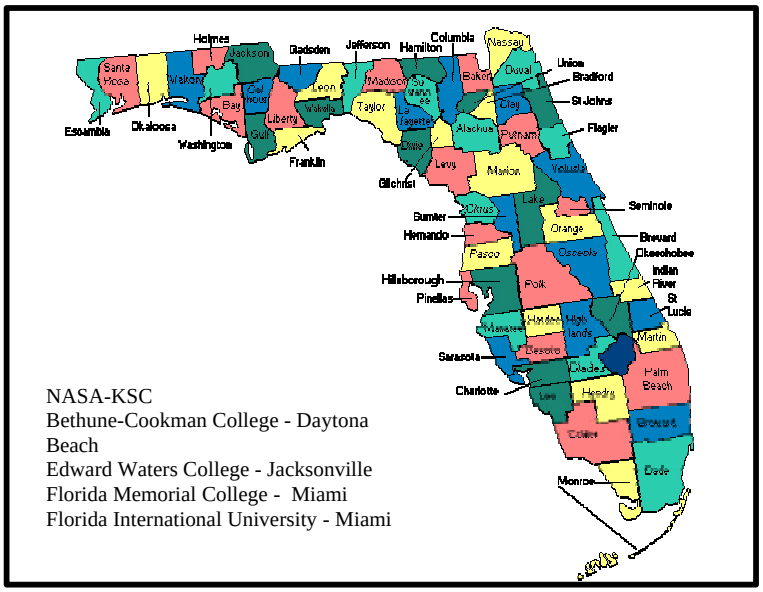

Figure 1. Graphical Representation of the FMIEP Project

Business and Marketing Assistance for the Technology Programs & Commercialization Office (TPCO)

A B-CC professor with business development and marketing experience together with students from B-CC's School of Business and Computer Science worked with NASA-KSC TPCO representatives. Furthermore, a professor with marketing experience assisted TPCO and students from B-CC's School of Business, who evaluated and recommended, develop enhancements to their marketing capabilities and strategies. NASA has recognized the need to increase its commercial technology efforts by engaging in the promotion of its technologies. B-CC's faculty and students have been researching and outlining a marketing and public awareness program plan for the NASA-KSC TPCO. This plan will help NASA-KSC to pursue new methods and to creatively market NASA-KSC technologies. During the first year, faculty and students from B-CC accomplished the following tasks: (1) developed four alternative marketing plans for KSC TPCO; (2) designed three sample brochures for TPCO as well as twenty samples of booth display materials; (3) submitted a preliminary Commercialization Marketing Plan to NASA-KSC TPCO for approval; (4) utilized state-of-the-art capabilities when creating and completing three homepages for NASA-KSC; (5) researched and created comprehensive database of media sources was within the state of Florida; and (6) began developing the "How to" Handbook that outlines the proven practices and techniques used for successful electronic commerce.

Technology Outreach Program (TOP) Assistance

The NASA-KSC TOP has established a network providing free technical assistance to businesses throughout the State of Florida. The program uses scientific and engineering innovations developed by NASA for space applications. These innovations are to be used by businesses in the community that need specific assistance in refining their technologies. Faculty and students from B-CC, EWC, and FMC with business development and marketing experience worked with the Flagler Chamber of Commerce, the Jacksonville Chamber of Commerce, the Beacon Council and the Broward Economic Development Council, to recruit and provide assistance to companies in the State of Florida, through TOP. Moreover, the faculty and students from the above institutions searched for companies that needed assistance from the following counties: Volusia, Flagler,

Jacksonville, Dade and Broward and introduced them to the program. After the first year of the program, FMIEP has accomplished the following (Becerra-Fernandez et. al., 1999):

1. A comprehensive listing of area companies, an assessment report on the current promotional program.
2. FMC joined The Beacon Council at their booth during the Business Expo '97 in Miami
3. Cable-TAP 36 aired a T.V. program featuring both FMC faculty and students included a segment on their TOP efforts.
4. B-CC developed 5 innovative ideas for the NASA-KSC TOP booth backdrop.
5. Between FMC, B-CC, and EWC, 783 company visits were made in support of the TOP.
6. During this year, eight Technology Transfer Agreements were submitted to NASA-KSC TOP.

Small Business Innovation Research (SBIR) Solicitation Assistance

A faculty member and students from EWC's School of Business lead this program, which seeks to target and assist Florida companies to apply and receive SBIR grants. Some of the first year accomplishments include:

1. The creation of "SBIR How To" Handbook. This handbook was designed for companies who are interested in developing proposals for SBIR contracts, which include internet searches and resources, proposal preparation instructions, locations of matching funds, dates of attendance for events and seminars, as well as a description of the award process.
2. 1,200 Florida businesses were identified as potential NASA/SBIR participants through various databases. In addition, A statewide survey of high-tech companies was conducted resulting in a database of 220 Florida Companies, who fit the profile of potential SBIR bidders. From the initial 220 companies, EWC has made contact with 66 companies.
3. 11 clients will be submitting SBIR proposals. The activities the faculty and students perform on behalf of the clients include data gathering, marketing research, proposal word processing, and providing assistance in finding experts.
4. A clearinghouse style website publicizing SBIR related information for state business http://www.cwc.edu/sbir, was created.
5. Organized the SBIR Phase I Industry seminar On March 18th, 1998. They arrange representation from Southern Technology Application Center (STAC), NASA/KSC, Naval Air Warfare Center, Service Corps of Retired Executives (SCORE) (a previous Florida SBIR winner), National Science Foundation, Athena Group, Florida International University and Enterprise North Florida. The seminar was attended by 45 companies from Florida.

Assistance to the Florida/NASA Business Incubation Center

The Florida/NASA Small Business Incubation Center provides economical rental space and business technical support to small, technology-oriented businesses with the help of NASA-KSC, Brevard Community College and TRDA. Faculty and students from FMC assist the Incubation Center tenants by developing updated business and marketing plans, accounting systems as well as an overall marketing plan for the incubator. The FMC group met with the current twelve tenants at the Incubation Center to inform them about the services provided by FMIEP. Tenants sent requests to FMC for specific assistance in the development and marketing of their products. FMC developed a competitive analysis and marketing plan for Highlander Inc., and as a result 1,800 applications for the products were identified for 380 firms. A marketing plan for the Incubator as a whole was submitted, which subsequently was used to secure a $216,000.00 enhancement grant for the Incubator. The tenants and the administration of the incubator benefit

immensely from business-oriented assistance from FMC faculty and students when preparing business and marketing plans, marketing communications materials, and promotional programs (Becerra-Fernandez et. al., 1999).

Technological and Engineering Assistance for the Technology Programs & Commercialization Office.

A faculty member and students from Florida International University (FIU) work with NASA-KSC TPCO to research and gather information necessary for technology commercialization and licensing. Technology commercialization is a primary goal for the Technology Transfer Program at NASA. The key mechanisms to achieve this goal are patent and copyright licensing. With FIU's assistance, NASA-KSC aims to identify commercial applications for eleven new technologies and seek-out commercialization partners (Buckingham, et. al., 1997).

FIU compiled comprehensive assessment reports for the following eleven NASA-KSC Technologies, which represents more than 100% of the assigned task. NASA-KSC was provided with 668 leads for potential commercialization partners and 110 new potential uses for the following technologies:

- Environmentally Controlled Abrasive Blastsuit (ECAB)
- Hydrogen Fire Detector Calibration Unit (HFDCU)
- Liquid Air Mixing System (LAMS)
- Low Differential Pressure Generator (LDPG)
- Mapping Analysis and Planning System (MAPS)
- Particle Fallout Monitoring System (PFM)
- Portable Ultraviolet Flame Simulator (PUFS)
- Remote Monitoring and Alarm System (RMAS)
- Supersonic Gas-Liquid Cleaning System (SGLCS)
- Test Aerosol Generator (TAG)
- Turbine-Driven Pipe-Cleaning Brush (TDPCB)

The Searchable Answer Generating Environment (SAGE)

The NASA/Florida Minority Institution Entrepreneurial Partnership (FMIEP) grant is funding the development of the "Searchable Generated Environment (SAGE) Knowledge Management System. The purpose of this KM System is to create a repository of experts in the State of Florida (FL) State University System (SUS). Previous studies have pointed out that there is a void in the ability to identify the capabilities in the SUS (Kotnour, 1998). Currently, each State University in Florida keeps a database of funded research, but these databases are disparate and dissimilar. The SAGE KM System creates one single repository by incorporating a quasi distributed database scheme, which can be searched by a variety of fields, including research topic, investigator name, funding agency or university. As NASA-KSC looks to develop new technologies necessary for the continuation of their space exploration missions, their need to partner with Florida SUS experts becomes evident.

The SAGE KM System combines and unifies existing data from multiple sources into one user accessible interface. Ideally the aggregated data would be accessible from one point of entry. For example, the data being accessed may consist of multiple data types that have been converted to a standard file format. SAGE consists of the typical university sponsored research data. One of SAGE's advantages is that there is only one point of entry or a web enabled interface, allowing multiple occurrences of the interface and giving the end user deployment flexibility. The main interfaces on the query engine use text fields to search the processed data for key words, fields of expertise, names, or other applicable search fields. The application processes the end user's query and returns the pertinent information (see Figure 2).

The purpose of the SAGE KM System is to unify myriad data collections into one database collection that could easily be mined for relevant data. SAGE will give university researchers more visibility, and at the same time will allow interested parties to identify available expertise within the SUS. This application helps to identify a researcher's expertise within a discipline, and to facilitate communication or a point of contact. The benefits of SAGE are: (1) SAGE is a repository of Intellectual Capital within the state of FL SUS; (2) SAGE helps locate FL SUS researchers for collaboration with industry and federal agencies, thus increasing the potential for research funding to the SUS; (3) SAGE enhances communication and allow more visibility for FL SUS experts, making universities more marketable; and (4) SAGE combines and unifies existing data from multiple sources into one user web-accessible interface. The SAGE system addresses an important KM problem: giving a user access to distributed knowledge, through a web-based Graphical User Interface (Becerra-Fernandez, 1999).

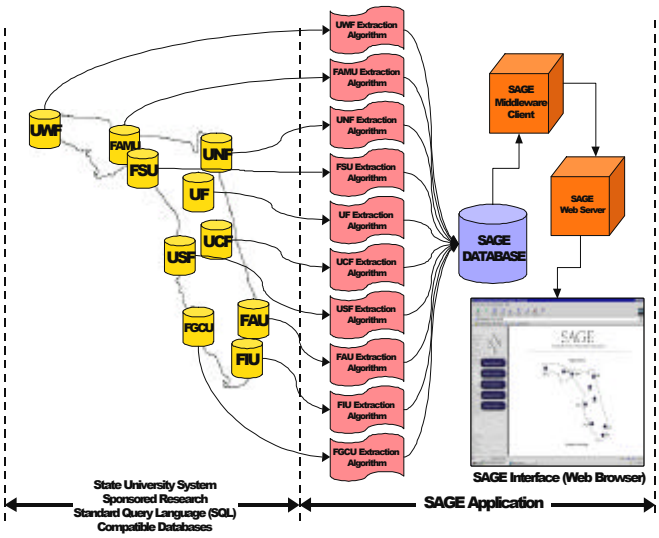

Figure 2. SAGE Architecture

Conclusion

The NASA/FMIEP consortium has successfully accomplished its goals and has actualized exceptional results in its first year. These results of this consortium have furnished great benefits to the Florida industry as well as the minority institutions participating in the project. The benefits

of the NASA/FMIEP program have strengthened relations between NASA-KSC and the minority institutions, thereby expanding the potential for prospective cooperative programs as well as by supplying talent and resources to existing outreach programs.

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